

Show all work on a separate piece of paper.

Solve the triangle. Round angle values to one decimal place. Round all other values two decimal places.

1. $A = 24^\circ$, $B = 68^\circ$, $a = 12.2$

2. $a = 10$, $b = 7$, $c = 8$

3. $A = 24^\circ$, $a = 11.2$, $b = 13.4$

4. $A = 23.4^\circ$, $b = 57$, $c = 86.5$

5. A flower bed is in the shape of an obtuse triangle. One angle is 45° and the opposite side is 28 feet long. The longest side is 36 feet long. Find the measures of the remaining angles and sides.

6. A painter needs to cover a triangular region 75m by 68m by 85m. A can of paint covers 75m^2 . How many cans of paint should he buy?

7. Two planes left the airport at the same time. Each plane is flying at a speed of 110mph. One plane flew with a bearing of N 60° E and the other flew in the direction of S 40° E. How far apart are the planes after 3 hours?

8. A blimp suspended in the air at a height of 500ft. lies directly over a line from Soldier Field to Adler Planetarium on Lake Michigan. If the angle of depression from the blimp to the stadium is 32° and from the blimp to the planetarium is 23° , find the distance between Soldier Field and Adler Planetarium.

9. Find the component form of a vector that has an initial point (1,5) and terminal point (15, 9)

10. Find the component form of a vector that has $\|v\| = 8$, and $\theta = 120^\circ$.

For 11-21, use $u = \langle -1, -3 \rangle$, $v = \langle -3, 6 \rangle$ to find the following:

11. $u + v$

12. $u - v$

13. $3u$

14. $2v + 5u$

15. $\|u\|$

16. $\|v\|$

17. Write vector v in trig form.

18. $u \cdot v$

19. $4u \cdot 2v$

20. $(u \cdot v)u$

21. Find the angle between the vectors u and v .

22. Find a unit vector in the direction of $v = 5i - 2j$.

23. Find the angle between the vectors $u = \cos 45^\circ i + \sin 45^\circ j$ and $v = \cos 300^\circ i + \sin 300^\circ j$

24. Determine if the vectors are orthogonal, parallel, or neither. $u = \langle -15, 51 \rangle$ $v = \langle 20, -68 \rangle$

25. Find the value of k so the vectors are orthogonal. $u = i - kj$, $v = i + 2j$

26. Write the complex number in trig form. $-\sqrt{3} - i$

27. Perform the operation. $\left[\frac{5}{2} \left(\cos \frac{\pi}{2} + i \sin \frac{\pi}{2} \right) \right] \left[4 \left(\cos \frac{\pi}{4} + i \sin \frac{\pi}{4} \right) \right]$

28. Perform the operation. $\frac{20(\cos 320^\circ + i \sin 320^\circ)}{5(\cos 80^\circ + i \sin 80^\circ)}$

29. Use DeMoivre's Theorem to find the indicated power of the complex number. $(2 + 3i)^6$

30. Find the cube roots of 8.